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ABSTRACT

Computer assisted instruction (CAI), an instructional system with direct interaction between the student and the computer, can be a valuable aid for presenting new concepts, for reinforcing of selective skills, and for individualizing instruction. The advantages CAI provides include self-paced learning, more efficient allocation of classroom time, and feedback that allows students and teachers to monitor progress. The disadvantages of CAI include difficulty locating specific, relevant programs and the time and limitations for writing alternative programs, and the inconvenience of computer "down" time. Teachers designing a CAI curriculum for a reading and study skills course, may choose modules of instruction for time management, study strategies, note taking, test taking, and independent study. If a designer must write a program, the services of various support personnel, such as a computer consultant, a programer, or a secretary to type in the program, may be enlisted. The designer should review the completed program and evaluate whether the original objectives were met. Students and other teachers can also evaluate the program, which will allow for continual updating and maintenance of the program. (HTH)

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COMPUTER-ASSISTED INSTRUCTION: ONE AID FOR TEACHERS OF READING

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Introduction

Computer assisted instruction (CAI) can be a valuable aid to the classroom teacher. CAI has been defined as an instructional system with direct interaction between the student and the computer. CAI tutorials may be used for presenting new concepts or, more commonly, for reinforcement of selective skills. It is also a valuable aid for individualizing instruction.

There are, at present, a limited number of programs available (Parry, 1980), and unfortunately, the content of available programs may not be applicable to the special needs of a teacher's students. Therefore,to take full advantage of the potential of CAI, it is proposed that teachers learn how to write their own computer programs. The writing of a tutorial need not be overly difficult. Many CAI author languages, intended for use by non-computer users, are available to simplify the creation of lessons. In addition, certain components of programming may be delegated to computer support personnel.

Advantages of CAI

CAI provides several advantages as a medium of instruction. One, if selected information can be covered by a tutorial, the class time normally allocated to present this information can be used to help students individually or to present new concepts. Two, practice in particular skills can be personalized. Three, students may proceed through the information at their own pace. Four, immediate feedback allows students to monitor their progress. Five, the format of presentation and reinforcement activities can be varied. That is, in addition to worksheets,

workbooks, reports, tapes, and other forms of instructional materials, CAI can be used as an additional resource. Six, with the existence of specific author languages, for example CALLS, (Computer-Assisted Language-Learning System) teachers can monitor students' progress. Then, if needed, the teacher can provide follow-up instruction/activities with students who need extra assistance.

Students in the Reading and Study Skills and Reading Rate Improvement courses at St. Cloud State University have been receptive to CAI. For example, students commented positively on multiple-choice test-taking information presented in programmed booklets (Langer and Wark, 1969). This information was subsequently reorganized and used in a computer program.

Students' responses have been even more enthuasiastic regarding the value of the information since its reorganization. These enthusiastic responses may be the result of several factors. Students are enthralled with the new presentation method. More importantly, students must focus attention on the information to answer questions so they can proceed through the program. In short, students must be active readers and, perhaps, are retaining more of the information. In contrast, some students simply read the booklets passively, looked at the answers, but did not interact as intensely with the information.

Disadvantages of CAI

There are disadvantages to CAI from both student and teacher perspectives. One, the teacher may experience difficulty locating specific, relevant programs. The alternative is to write programs; however, this takes time and teachers usually have limited time for such

extensive tasks. In addition, most teachers do not have the expertise to write programs; workshops or courses may provide this expertise. Two, programs can be boring to students, a factor which can be eliminated as the teacher gains knowledge in writing programs. Program relevancy decreases the "boring" complaint. For example, if the information may be included on a test, the student will usually find the information useful and attend to it. Three, many students are fearful of computers. This factor can be eliminated by an introductory session familarizing students with computer terminal operating procedures. St. Cloud State University Computer Center has developed a videotape introducing students to such procedures. In addition, several instructors who use CAI within their courses developed handouts acquainting students with procedures for working with computers. Four, the large scale computer systems are, on occasion, "down," that is, the computer may not be operating at the time the student has scheduled to complete the program. The student can always reschedule; however, it is an irritation and often inconvenient to reschedule. This problem has, as yet, not been eliminated.

Designing Curriculum to Include CAI

When designing curriculum for a particular course, the instructor may follow a sequence of events (see Figure 1). First, modules of instruction which will meet the general objective(s) for the course are selected. In the Reading and Study Skills course, St. Cloud State University, the modules of instruction included time management, study strategies, note taking, test taking and independent study. These are not discrete modules but rather modules which build upon each other.

Second, each module of instruction may be divided into components. Resources for meeting the specific objective(s) of each component are developed. Finally, each module with its components is evaluated and the instructor makes modifications based on student feedback, research, and new technology. For example, in the Reading and Study Skills course, modifications were the result of instructor awareness of CAI and the realization that information presented in the multiple choice test taking booklets (Langer & Wark,1969) could be presented via CAI. Students could complete this program out of class and the in class time could then be used for presenting/discussing other information. In addition, the instructor felt some students were reading through the multiple choice test taking booklets too passively. The instructor wished to determine if students would focus more intently on the information in the test taking booklets if the information was presented via a computer program. Thus far, the new system is working extremely well.

General Steps

Develop general objective(s) of course

Identify modules of instruction to meet objectives

Specify components of each module

Reading and Study Skills Course

To assist students in developing and refining skills to meet the academic requirements of their courses.

Time Management Module

Study Strategies Module

Notetaking Module

Test Taking Module

Independent Study Module

Component 1:

General Test Taking

Component 2:

Writing Essay Tests

Component 3:

Taking Multiple Choice and True-False Tests

Objectives:

To increase student awareness of test taking hints.

Select Resources to Meet Objectives

1. Pauk, How to Study in College Ch. 12,13
2. Millman & Pauk How to Take Tests, Ch. 7
3. Class Discussion
4. Mod 10 Tape on Examination
5. Computer Program I, Required(new)
6. Computer Program II, optional(new)

Figure 1: This diagram depicts a curriculum design procedure which an instructor may follow. The multiple choice component of the test taking module in the Reading and Study Skills course is elaborated upon.

Development Of A CAI Program

A curriculum designer may follow a series of general steps when developing a CAI program (see Figure 2). The idea for the program must be generated. Next, the designer should review existing programs and determine if there is an appropriate program which may be used. If an appropriate program cannot be located, the designer must write one. The task of developing the test taking programs for the Reading and Study Skills course, St. Cloud State University, was simplified because the booklets written by Langer and Wark (1969) were already written within a programmed format. Wark (personal communication) gave permission for the information to be reorganized within a computer program format.

Before writing a CAI program, the designer must select a computer language. Many CAI author languages are available which simplify the programming task. The test taking programs were written in the CALLS author language, a language which was developed at the University of Minnesota. CALLS was selected because it was simple to use and had the capability of monitoring student progress, that is, it would record student scores.

After selecting the language, the designer develops the objectives for the program, and begins the writing task. While writing the program, the designer may utilize the services of various types of support personnel. A computer consultant can answer technical questions, and a programmer (perhaps a student) can do the actual coding of the program. A secretary can type the program into the computer. Utilizing these types of support personnel decreases the time the designer must allocate to the project. Time is a precious commodity for classroom teachers. Therefore, if

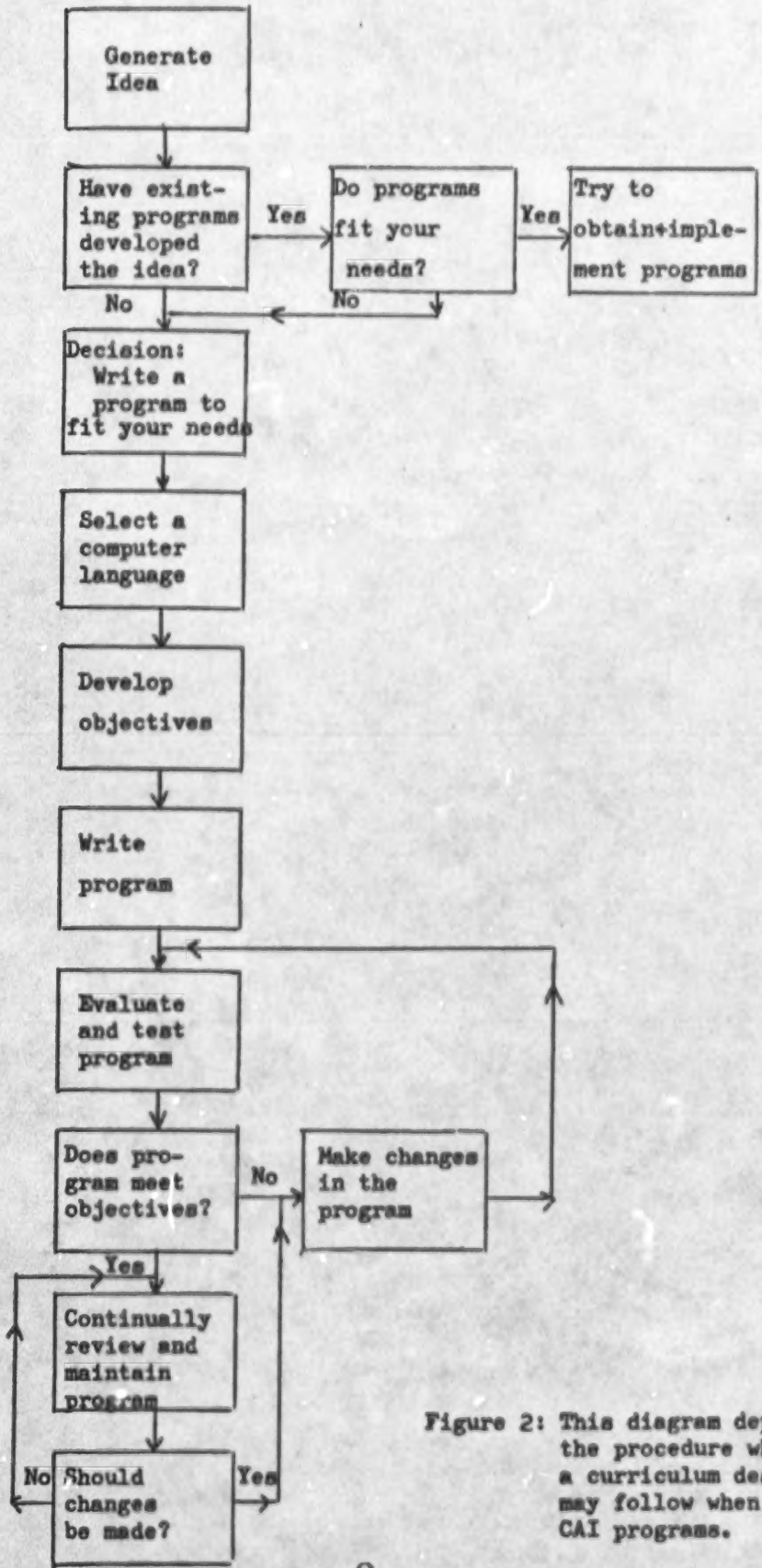

Figure 2: This diagram depicts the procedure which a curriculum designer may follow when developing CAI programs.

classroom teachers are to become designers of CAI, they will need to seek out and use the services of support personnel.

After completing the CAI program, the designer should review it and evaluate whether or not the original objectives were met. The program can also be evaluated by other sources, for example, colleagues who are knowledgeable in the subject matter. Students can also critique the program. In fact, students served as excellent evaluative sources for the test taking program, and based upon their critiques, the summary was rewritten. In addition, a handout was created to facilitate the students' use of the computer.

The final stage involves the continual reviewing and maintenance of the CAI program. Based upon student critiques, improvements/enhancements will occur. In addition, the designer may make changes based upon new research. Another factor to consider is that conditions in the computer environment may change, for example, new equipment may be purchased. This did happen at St. Cloud State University. The Computer Center purchased new terminals and students then had to be oriented to these terminals. This necessitated a change in the student handout explaining how to operate a terminal.

Summary

CAI can be a valuable resource for the classroom teacher. However, as in developing curriculum using any medium, it takes time to generate ideas and actually design the programs to implement the ideas. As more resources, that is, more programs, are available, the time consuming task of development may be lessened. This fact was illuminated recently. Specifically, the authors were planning to write additional programs

for the Reading and Study Skills course. An article by Sampson (1981) describing a CAI program involving lessons focusing on study skills was found. The authors will review this program and,in addition, will initiate plans to purchase the program.

The team approach may be the most effective and efficient method to use in accomplishing the task of designing CAI programs. The team would consist of the classroom teacher, computer consultant, programmer and a secretary.

The future, in general, looks bright for CAI. Although there is much work yet to be accomplished, especially in regard to CAI programs for the Reading and Study Skills area, it appears that CAI has had a positive beginning.

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